

What is claimed is:

1. A process for the preparation of barium titanate powders, comprising separately and simultaneously introducing into a high-gravity reactor an aqueous solution (I) containing salts of barium and titanium, preheated to a temperature of from 60°C to 65°C, and having a Ba/Ti molar ratio of more than 1, and an aqueous basic solution (II) containing an inorganic or organic base, preheated to a temperature of from 60°C to 100°C; and performing the reaction of the solution (I) with the solution (II) at a temperature of from 60°C to 100°C, while maintaining the reaction mixture at a constant OH^- concentration, then filtrating and washing the resulting powdery reaction product with deionized water to remove impurity ions and excessive barium ions, and finally, drying to obtain barium titanate powders.

2. A process according to claim 1, in which in the solution (I), the total concentration of metal ions($\text{Ba}^{2+}+\text{Ti}^{4+}$) ranges from 0.1 to 2.0 mol/L and the Ba/Ti molar ratio is more than 1, preferably from 1.2 to 2.0, and the base concentration in the solution (II) ranges from 3 to 15 mol/L.

3. A process according to claim 1, in which the flow rates of the solutions (I) and (II) vary from 5 to 300L/h.

4. A process according to claim 1, in which the flow rate ratio of solution (I) to solution (II) ranges from 0.5 to 10.

5. A process according to claim 1, in which the pH value of the reaction mixture is maintained constant at about 14.

6. A process according to claim 1, in which the salts of barium and titanium are selected from the group consisting of halides, nitrate, acetate, perchlorate, oxalate and alkoxides, and the base is selected from the group consisting of alkali metal or alkali-earth metal hydroxides, and quaternary ammonium bases.

7. A process according to claim 1, in which the salts are chlorides and the base is NaOH, KOH or quaternary ammonium bases.

8. A process according to claim 6, in which the quaternary ammonium bases are tetramethylammonium hydroxide.

9. A process according to claim 1, in which said high-gravity reactor is a rotating packed-bed reactor and the high-gravity level of the rotating packed-bed reactor ranges from 1.25G to 12,500G.

10. Barium titanate powders prepared by the process according to any one of claims 1 to 9, consisting essentially of primary crystalline particles having a uniform particle size and an approximately spherical morphology.

11. Ceramics obtained by sintering the barium titanate powders according to claim 10.

12. Ceramics according to claim 11, exhibiting uniform microstructures, homogeneous chemical compositions, small grain sizes and dielectric constants as high as 2,500.